BELLCOMM, INC.

SUBJECT: Fifteenth Meeting of the Apollo Saturn Electrical Panel, MSFC, Huntsville, Alabama November 3, 1965 - Case 330

DATE: November 16, 1965

FROM: D. M. Duty
P. F. Sennewald

ABSTRACT

The fifteenth meeting of the Apollo Saturn Electrical Panel was held November 3, 1965, at MSFC, Huntsville, Alabama. The meeting reviewed action items and their resolution, subpanel reports and problems still outstanding. Of specific interest:

1. An ESE subpanel will be chartered with S. G. Embrey representing MAS.

2. ICD's for missions following AS-504 may be delinquent due to the lack of official spacecraft-to-launch vehicle assignments in the AFMA. The PRB will be informed of this situation.

3. Phenomena experienced during Saturn I and GT launches involving measurement of excessive potential gradients on lightning instrumentation are being investigated.

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MEMORANDUM FOR FILE

INTRODUCTION

The fifteenth meeting of the Apollo Saturn Electrical Panel (ASEP) was held November 3, 1965, at MSFC, Huntsville, Alabama. The meeting was chaired by H. J. Fichtner. A list of attendees is attached.

ACTION ITEM REVIEW

Action items from past meetings were reviewed. The following are of interest:

(1) A Q-ball will not be flown on SA-206.

(2) There will not be a redundant Q-ball. This was to have been effective on SA-204. However, the function of the Q-ball will be backed up using existing sensors in the CM to sense lateral forces. The result will be displayed in the CM and checkout provisions will be provided effective on AS-202.

(3) Requirements for information and information display to the Launch Director for initiating a request for abort have not been resolved. This is required for ESE implementation. Regardless of resolution, it is already too late to implement this for AS-201.

PANEL AND SUB-PANEL MEMBERSHIP

The membership of the panel and sub-panels was reviewed. MAS will be represented by:

P. F. Sennewald - ASEP

S. G. Embrey - EDS Sub-panel

W. J. Martin - Computer Sub-panel.

The panel agreed to form an ESE sub-panel. A charter will be written by A. D. Haley of MSFC and J. D. Harris of MSC and membership determined before the next ASEP meeting. S. G. Embrey will represent MAS.

EMERGENCY DETECTION SYSTEM (EDS) SUB-PANEL REPORT

EDS ICD's for AS-204 and 205 have been signed off and released. AS-501 and 502 ICD's could not be signed off due to:

(a) Automatic abort enable not settled (PRB decision has resolved this item).

(b) Automatic abort unsafe must be implemented in MSFC ESE.

(c) The implementation method of one engine out automatic abort on Saturn V (approved by Apollo Crew Safety Panel) is not resolved.

MSC has requested a manual deactivation of the range safety command destruct system at launch escape tower jettison. Range safety will probably not accept this procedure; however, in an abort they have agreed not to send a destruct signal after tower jettison if engine cutoff can be verified. This problem will continue to receive the sub-panel's attention.

A KSC study has been made of redundant circuits and the ability to check redundancy before the mission. There are cases of parallel coils and contacts in the MSC hardware which cannot be checked out. These are being investigated but there was some doubt as to the ability to put in a fix. The ASEP position is that all redundant circuits must be checked out.

OUTSTANDING PROBLEMS

The following problems represent the more significant ones discussed:

1. RF Silence - KSC wants the Test Conductor to be able to inhibit all RF radiation through an interlock switch. MSC considers a display indicating which RF systems are radiating to be adequate. This problem will be resolved in ten days for AS-201. There

will probably be an indication on the Test Conductor's console derived from a summing circuit using inputs from RF sensors. The implementation of an interlock control will be considered specifically for AS-206.

3. The ASEP will inform the PRB that ICD's for missions following AS-504 may be delinquent due to the lack of official spacecraft-to-launch vehicle assignments which are necessary for ICD preparation. The three month lead required for ICD preparation coupled with current ICD due dates will result in delinquent ICD's in the near future. It was suggested that the ASEP give specific dates and missions in their communications with the PRB.

LIGHTNING PROTECTION AT KSC

A presentation was given by representatives from KSC on lightning protection and experience of lightning strikes at the various launch pads. Of interest were:

(1) It has been observed that potential gradient meters located at various facilities as part of lightning instrumentation have exceeded their full scale (full scale = 15 K volts/meter) reading during Saturn I and Gemini/Titan launches. For lightning strike prediction, 1200 to 2400 V/M is considered significant with impending storms. This phenomenom is being investigated.

(2) The present lightning prediction system has a capability of predicting a lightning strike location to within five miles. Work is being performed to increase this resolution to 1/4 mile.

(3) There have been no known violations of the 1:1 (i.e. 45°) cone of protection at KSC.

(4) At present there are no requirements for lightning protection of the S/C while in transit from the MSOB to the VAB. KSC will determine if a requirement is necessary.

FUTURE MEETINGS

The next meeting of the ASEP will be held the first week in February at KSC.

D. M. Duty

P. F. Sennewald

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Attachment
List of Attendees

Copy to
Messrs. T. A. Keegan - NASA/MA-2
M. J. Krasnican - NASA/MAT
J. Kubat - NASA/MAP
R. V. Murad - NASA/MAT
J. H. Turnock - NASA/MA-4
S. Winn - NASA/MAP

C. Bidgood
J. P. Downs
J. A. Hornbeck
B. T. Howard
J. Z. Menard
C. R. Moster
I. D. Nehama
T. L. Powers
I. M. Ross
T. H. Thompson
G. B. Troussoff
R. L. Wagner
All Members Department 2031
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ATTENDEES

NAME	ORGANIZATION	PHONE
A. D. Haley	MSFC/R-ASTR-ES	876-2804
M. J. Krasnican	MSF/MAT	962-0457
S. C. Jones	MSC/ASPO-PS6	483-4911
E. B. Hamblett	MSC-ASPO-PS	483-4646
J. D. Harris	MSC-ASPO-PH4	483-5231
J. L. Cochran	MSFC/I-I/IB-E	876-9113
D. W. Moore	MSFC/R-ASTR-ESI	876-6774
C. R. Roach	G.E./Huntsville	881-3192 Ext. 587
V. W. Ruwe	G.E./Huntsville	881-3192 Ext. 549
W. G. Shields	MSFC/R-ASTR-ES	876-5327
A. P. Spears	MSFC/R-ASTR-E	876-6762
H. J. Fichtner	MSFC/R-ASTR-E	876-2436
P. N. Bosworth	G.E./KSC-EDV-13	867-7042
C. E. Wolfe	KSC-EDV-13	867-5634
J. A. Kenny	NAA/S&ID HB16 Downey, Calif.	Area Code 213 923-811 x 3637
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J. H. Guest	GAEC-Bethpage	(516) 575-7757
A. K. Lesher	Sperry Rand/R-ASTR-EA	876-6244
D. M. Duty	BELLCOMM/MAS/APO	269-8379
R. G. Smith	MSFC/R-ASTR-EA	876-2567
J. M. Porter	MSFC/I-IB-G	877-2425
A. A. Conway	MSFC/I-V-E	876-3633
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B. Hancock	MSFC/G.E./R-ASTR-E	881-3192-535
G. G. Bishop	MSFC/R-ASTR-ES	876-6084